



IV. Logistics and Co-Modality

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Content

Abstract

1. Introduction
2. Benefits and Challenges
3. General Expectations
4. Milestones
5. Roadmaps
6. Recommendations

Appendix

Abstract

For the common European market to function smoothly there is a need for an integrated, green and efficient transport system that allows the free movement of goods and people within, and into and out of, EU territory. This is vital for economic growth and European cohesion and the well-being of its citizens. An integrated transport system clearly calls for harmonisation of rules and interoperability of networks.

In order to reach these goals, research will be needed on innovative infrastructures (e.g. Forever Open Road, energy neutral or energy generating motorways), on new organisational concepts (payload sharing, advanced logistics, supply chain management and e-freight) and methods of working related to their introduction and on innovative vehicle technologies (such as modular vans and lorries, electric and diesel-electric vehicles).

In addition, further research is needed on the measurement of transport impact on society, especially the development of consensus on the measurement framework for transport and logistics environmental footprint, and on the measurement of transport and logistics performance.

A series of complementary measures, such as financial incentives, creation of public private partnerships and an appropriate regulatory framework, are needed to prepare for market

take-up. It is important to not only define these measures, but also understand their potential impact and interaction.

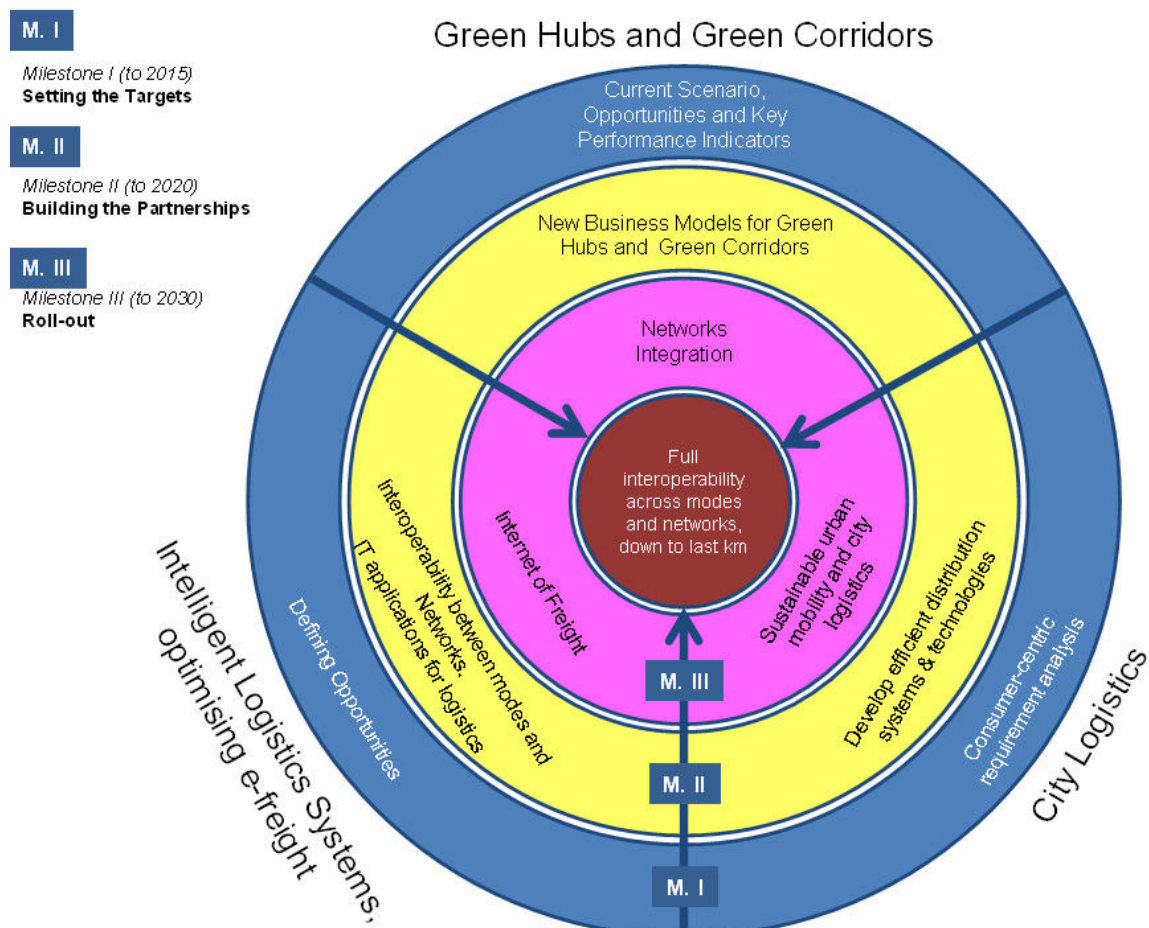
This paper sets out a three pronged approach, focussed on City Mobility, Green Hubs & Green Corridors and improved logistics control in combination with e-freight solutions, with the aim to improve the overall efficiency, and substantially reduce the carbon footprint, of the European transport system.

The benefits and challenges of an approach which is not purely technological but rather of organisational in nature and new ways of doing business are described. Milestones are identified and road maps defined that highlight the steps to be taken to achieve the desired objectives.

This document is based on the consensus among the participants of EIRAC (European Intermodal Research Advisory Council).

Its purpose is to stimulate the debate about the multi-annual implementation of the European Green Cars Initiative from the perspective of the opportunities that co-modality and logistics can offer, also looking at the social and political acceptance by citizens, authorities and the business itself. In particular, new organisational concepts of doing business, i.e. night deliveries through electric vehicles, opening hours of terminals in 'green corridors' where around the clock eco-liners may be used etc.

This roadmap can be summarized by means of a figure:



1. Introduction

The demand for freight transport, both over long distances as well as in the urban environment, is growing continuously; road haulage is taking the lion's share of the market.

Nevertheless today's European Transport System is still inefficient. For road haulage on average 24% of goods vehicles in Europe run empty. The other lorries are only partially loaded and have an average load capacity of only 57%. Eliminating, or at least drastically reducing, this inefficiency is a major challenge for policy-makers and the transport industry alike. A 30% increase in efficiency would create an estimated economic value of €22 billion for the Transportation Industry. The current state of empty running in Europe is illustrated in Figure 1.

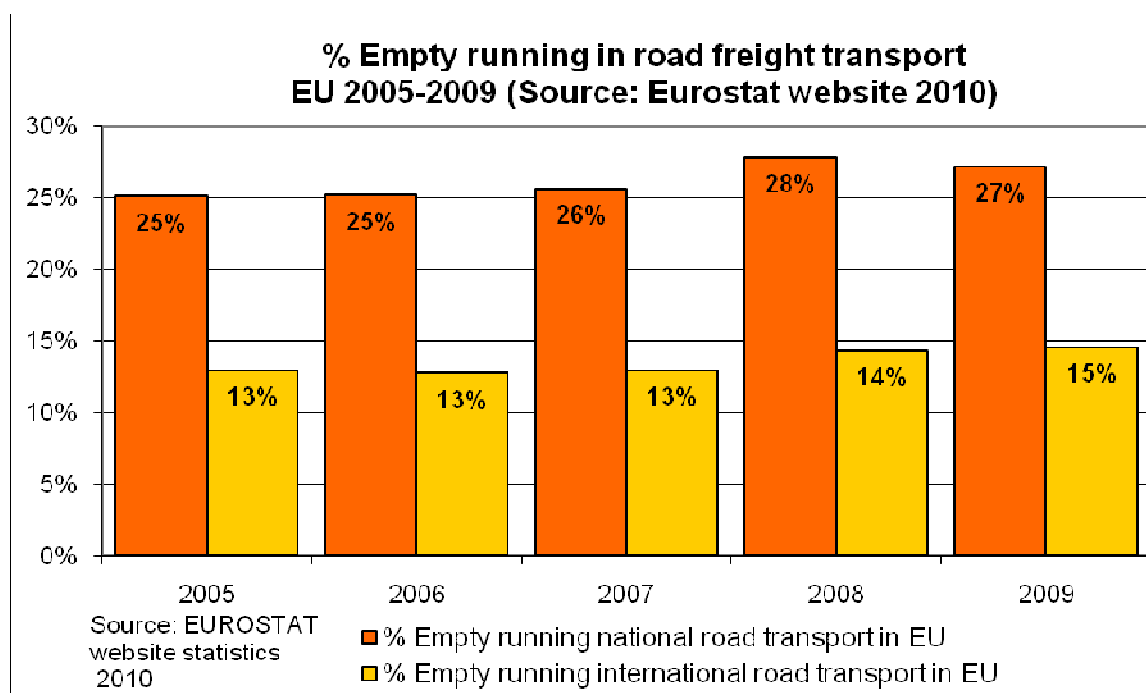


Figure 1: Empty running in the EU

As a result of the expected growth of transportation in and around Europe, transport emissions, and especially CO₂, are also a continuing concern for policymakers and practitioners. While more and more stringent rules are put forward (EURO4, EURO5 for trucks), transport will remain one of the main contributors to emissions. The following figure illustrates this.

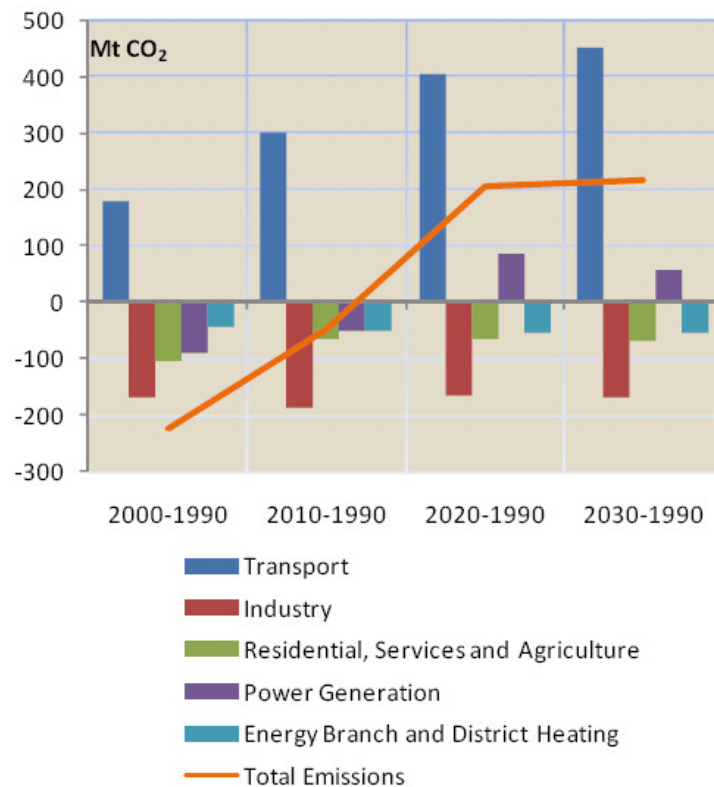


Figure 2: Change of CO2 emissions since 1990

Source: DG TREN (2007) European Energy and Transport Trends to 2030

Finally, road congestion is generally increasing around Europe. This is connected with the concentration of economic activities, around cities and other clusters of activities (ports, industrial zones). Currently, 60-70% of the European population lives in and around urban areas, and this will increase. In addition, 85% of GDP is generated in urban areas. As a result, the urban areas bear the major burden of traffic congestion and other negative effects of transport, such as pollution, noise and vibration. A further complexity in mobility in urban regions is that freight and people use largely the same infrastructure.

There are very little concrete figures available on the degree of congestion in Europe, apart from a few quotes: 7500 km of roads are blocked by traffic jams, and the traffic congestion adds 6% to the EU fuel bill, total delay in London's urban centre was 2.3 minute/km before, and 1.8 minute/km after the introduction of the congestion charge.

Against this background, the Commission stressed the need to improve levels of accessibility and mobility for citizens and freight in urban areas especially given the clear deteriorations in congestion, safety and quality of air in major cities. An integrated approach to transport planning has to be taken which treats freight and citizen mobility simultaneously. This road map focuses on nodes in the transport system where the negative effects of transportation are the most poignant, but looks for solutions at both creating more efficient nodes and forging better connections between nodes.

At the same time, the Commission, in its mid-term review of the Common Transport Policy White Paper, highlighted the need for improved logistics and co-modality (the use of different modes in combination to obtain a sustainable utilisation of resources) in the overall transport systems. Logistics/co-modal transport coordination is a specific capability that will enable and facilitate the solutions required to improve the quality of the European transport

system that can be measured by levels of performance, congestion, pollution. The development of this capability is the underlying goal of this roadmap.

The targets to measure the impact of this roadmap against are:

1. Transport efficiency, as measured by average load factor, km or % empty running of trucks, utilisation rates of terminals and cargo handling facilities; Current level: average load factor of 57%
2. Transport emission, as measured by CO₂, NO_x, SO_x and small particles; Current level: 270 mln ton of CO₂ emission (2010 projection Tremove data).
3. Congestion, as measured by average time loss, average traffic jam length and time. Current level: 7500 km of roads congested in Europe.

In order to most effectively tackle the key issues related to co-modality, a three pronged approach should be taken addressing:

- City logistics
- Concentration of long distance freight traffic in major (Green) Hubs and along (Green) corridors (which link the hubs)
- Intelligent logistics solutions reflecting the optimisation of e-freight initiatives.

This document collates input from major Commission policy initiatives starting from the Mid Term Review of the Transport White Paper (in particular Freight Logistics Action Plan, e-freight, the ITS Action Plan, the TEN-T programme) and it seeks to integrate (and to prepare for a market roll-out) the results of a whole series of previously funded EU projects at European level, (which are relevant the three subject areas). These include Freightwise, e-freight, INTEGRITY, Smart-CM, Euridice, Citylog, Bestuffs, etc.

2. Benefits and Challenges

City Logistics

City Logistics could be defined as follows:

- Transport and logistics activities in geographically concentrated in densely populated areas,
- The organisation required to move large amounts and different sized volumes of parcels or goods

City logistics addresses the movement of freight distribution in urban areas, improving the efficiency of urban freight transportation, reducing traffic congestion and mitigating environmental impacts. The principle challenge is to be able to treat these simultaneously. In addition, last mile transport in small volumes is currently largely unprofitable, which is a bottleneck for innovation.

Key elements to take into consideration:

- by 2020 70 to 80% of the European population will live in urban areas
- Urban freight represents 10 to 15% of vehicle equivalent miles travelled on city streets and two to five percent of the employed urban workforce.
- Three to five percent of urban land is devoted to freight transport and logistics.
- A city not only receives goods, but also ships them: outgoing freight represents 20 to 25% of truck-km in urban areas, incoming freight 40 to 50%, and the rest originates from and is delivered within the city.
- Transport companies providing urban freight services are generally very small. In Europe, 85% of short distance truck companies have less than five employees
- every year €100 billions, or 1% of the EU GDP, are lost to the European economy as a result of delays and pollution related to urban traffic;
- Urban traffic is responsible for 40% of CO₂ emissions and 70% of other pollutants
- arising from road transport.

Electric vehicles are considered to be the most suitable solution for the operating conditions of urban freight while ensuring low noise level and no local environmental impact. No real industrial developments were done by vehicles manufacturers due to strong economical pressure by operators. Public funding is therefore necessary to fill the gap towards economical viability of this sector.

The main targets for improvement of city logistics are the following:

- improve **load factors** and cost levels of last mile delivery
- reduce **CO₂ emissions** as well as other emissions from city logistics in urban areas
- remove **congestion**, delay and time loss due to freight transport in urban areas.

As a first step, more extensive measurement of the problems, bottlenecks and transport system performance is required. Currently, no clear statistics on the extent congestion and its consequences are available for metropolitan areas in Europe. This work should build on the many previous efforts in this field, such as CIVITAS, Bestufs, etc.

The way to achieve these targets is to reduce the number of truck movements while maintaining a sufficient level of product availability to demand of citizens. The introduction of innovative electric vehicles, modular vans etc will enable new transportation and

distribution concepts to be deployed. They should lead to fewer trips, reduced congestion, improved safety and improved economics (for all the actors involved). The key factor will be that cities throughout the EU will develop standardised technical solutions avoiding the fragmentation or customisation of systems which has, in general, been detrimental to urban transport.

It is recommended to rapidly develop a pilot project with the aim to demonstrate logistic solutions with electric vehicle applications for optimising urban logistics efficiency to better manage transport flows and reduce the environmental impacts (noise, CO₂ emissions & pollutants) in urban areas.

The demonstration could contain the following elements:

- Demonstration of urban and logistics solutions with electric vehicle fleets with the aim to validate the feasibility of logistic solutions on the basis of electric vehicle applications leading to better efficiency of transport flows and reduction of the environmental impacts (noise, CO₂ emissions & pollutants) in urban areas
- Assessment of these logistics solutions based on electric vehicle fleets compared to existing solutions (city planning, ITS systems, distribution centres and their link with long distance transport networks, different modes, bundling of flows, sharing knowledge).
- Assessment of public acceptance of demonstrated new delivery systems.
- Assessment on urban transport and delivery market such as size of deliveries, frequencies, vehicle types used (including consumer's cars).
- Assessment of the impact on energy and environment.

Eventually, the work on improving city logistics will have to move from projects in selected cities to an overall European approach. Benchmarking, and project and impact comparison are important steps in this process. In addition, the development of a European solution to urban freight transport needs to incorporate promising and proven solutions, a vision on the comparability and specificity of cities, and a definition of the role of European regulation.

Green Hubs and Green Corridors

This domain covers the development of efficient interfaces in the transport system, or 'green hubs'. Efficiency in this context is defined as high operational performance, effective use of resources, limited impact on the surroundings and the environment. The approach to develop hubs according to this ambition has two dimensions:

1. the improvement of the hub itself, focusing on operational improvements, reduction of energy use of processes in the hub, and so on, and
2. relieving the hubs of temporary or geographically concentrated pressures by connecting the hubs with each other.

The latter approach is also included in this domain, through the development of 'green corridors'. This means that the connections between the hubs should adhere to the same standard as the green hubs: high operational performance, effective use of resources and limited impact on the surroundings and the environment.

Green corridors should be conceived as long-distance freight transport corridors between those major hubs both within Europe and between Europe and other parts of the world. Green corridors are not a parallel or competing set of transport corridors but mark rather a

holistic approach to European transport policy. It brings together the objectives of reducing emissions, increasing energy efficiency; combining efficiently various transport modes (with the right level of innovation in each of these modes) and supporting the competitiveness of European industry and transport.

The focus is on enabling the choice of environmentally friendly modes and transport technology, while not jeopardising the need for an efficient transport operation. It is the aim in this corridor concept to concentrate technological innovations on specified routes where the flows are 'captive' and that this technology can be managed effectively and efficiently. In addition to the "hard" physical infrastructure (such as roads, inland waterway infrastructure, rail tracks, ports and terminals) "soft" infrastructure will also play a role in the green corridor concept. For example, smart traffic management systems will allow reducing congestion and the distance travelled due to better route planning, which in turn should contribute to less pollution.

The Green Corridor concept has strong links with the business sector, in particular with logistics services. They are driven by an optimised use of all transport modes and network planning based on existing and forecast traffic flows. If the business sector is to utilise Green Corridors, the latter will have to be at least as efficient as other transport corridors.

Various studies have demonstrated that eco-driving and aerodynamics of vehicles can reduce fuel consumption by over 10%. Collaborative planning can allow for a reduction of empty running and improve load utilization on all modes of transport. Therefore, the development of green corridors should also involve the evolution and assessment of new business models based on collaborative arrangements across partners in supply chains and due to the experimentation of innovative approaches in the regulatory framework of transport. Given that corridors and hubs also involve infrastructure, the explicit development of new models of public private partnerships, in which not only the investment, but also the level of innovation is made part of the partnership, need to be considered as ways to achieve green hubs and green corridors.

The main targets are:

- improve **load factors** and the balanced use of modes of transport across the European freight transport system
- reduce **CO₂ emissions** as well as other emissions, and energy use in green hubs and corridors
- remove **congestion**, delay and time loss in and around the green hubs.

As a first step, more extensive measurement of the problems, bottlenecks and transport system performance is required, as well as the development of a vision on the definition of green hubs and green corridors. One of the main challenges is to select the candidates for green hubs and corridors, as well as develop a method of selection that is appropriate in the European context.

Furthermore, new coordination and control mechanism are required to guide the balance between transport modes from the green hubs. These mechanism can build on current state of the art in information and decision sciences, where new allocations and governance mechanisms are being developed in wholly different contexts, such as agricultural auctions, packet routing in telecom networks, and so on. Apart from a measureable 'green performance' this type of capability will be a main characteristic of green hubs.

Further challenges are:

- continuous innovation in equipment design and deployment;
- improved integration with hinterland transport technology and infrastructures,
- organisational innovation to achieve optimum performance,
- defining the appropriate investment (e.g. via the revised TEN-T Program,) to remove infrastructure constraints around transfer nodes

The final step in the development of green hubs and corridors is the integration of initiatives across Europe into one comprehensive coherent network of green hubs and corridors. Ideally, most if not all of the TEN-T core network should be covered by a network of Green corridors. This requires standardisation of approaches, as well as consensus on the definition and measurement of the level of 'greenness'. In addition, networking will go hand in hand with the proliferation of technology development. Therefore, knowledge sharing, benchmarking and co-design are important pre-requisites for European networking.

Intelligent Logistics Systems: optimising the use of e-freight initiatives

Existing infrastructure and vehicles can be used more efficiently by developing sophisticated logistic chains and networks, which use advanced information and communication technologies. While the foremost imperatives of introducing such logistic chains are to reduce costs and to maximise benefits, it is also essential to manage the degree of co-modality, the environmental footprint of transportation activities, the efficiency of the use of transport modes, and the negative effects of transportation. This management requires data that needs to be generated to a much larger extent than is currently the case. Efficient supply chain management or intelligent logistic systems therefore have a twofold bonus: security and carbon footprint reduction.

The provision and generation of information from transport activities that can be used to better plan and coordinate other transport activities requires substantial new solutions in information management, data processing, real time planning, data capture technology, and monitoring and evaluation, both by business and by authorities. There is also an important connection to the development of Single Window Platforms which are expected to play an increasingly important role in the future efficiency and sustainability of freight. This is a key area in the EU Freight Logistics Action Plan. More effective provision of information will not only, for instance, match loads to capacity more efficiently, but information availability will also enable government agencies (customs, police, ...) to improve their performance in supervising business activities, increase their hit-rates, and remove administrative bottlenecks.

The main targets are:

- improve **load factors** across the European freight transport system due to the use of better and more timely information on freight supply and demand,
- reduce **CO₂ emissions** as well as other emissions, due to better measurement, and more appropriate performance based regulation
- remove **congestion**, delay and time loss in and around the green hubs, due to improved information provision to transport operators.

As a first step, the further development of e-freight initiatives leading to the integration of information across supply chains and logistics systems is required. This also entails carrying the standardisation of messages and documents further, and developing the level of 'informatisation' of transport operators and transport service providers, as well as relevant authorities. This will also enable further system integration with port community systems, and other private global data platforms such as GT Nexus, while achieving user-friendliness and interoperability.

Another important development is to standardise the measurement frameworks on transport performance, environmental footprint and negative transport effects, and, more importantly, develop ways to feed these measurement frameworks with actual, real time data feeds obtained from ongoing transport and logistics operations. A further challenge is to develop a regulatory framework in which partners in the supply chain are allowed to exchange and share information between and amongst existing shared information or supply chain management networks, without facing immediate claims of violating anti-trust regulation, or other impediments.

Finally, integration e-freight initiatives at the European level are required to reap the full benefits and achieve real progress on the targets specified above. This requires not only a push on IT investments and choices for the right architectures, standards and approaches, but also the explicit recognition of the similarities and differences in the governance and government supervision of logistics activities across Europe.

The creation of improved supply chain operations will have great repercussions for the demand for service quality and volume of transport systems. With the advent of RFID and similar identification technology in the supply chain the development of Intelligent Cargo systems at the European level is within reach. In addition, possibilities for horizontal collaboration between shippers and increasing responsiveness needs will drive shippers increasingly to develop hybrid distribution channels. A major advantage of these channels is that they allow further bundling of freight between firms. However, this efficiency gain will only materialize if shipper and carrier information systems are sufficiently interconnected and interoperable. This extends the e-freight roadmap towards synchronization between transportation, inventory and production schedules between firms.

3. General Expectations

The current trend is that customers and shippers no longer think in terms of the ways or means by which commodities reach their destination – their principle concern is where the goods arrive and when.

The ambition is for physical transport flows, supported by efficient information sharing networks, that are:

- **Seamless** – barriers to modal exchange at nodes are minimised
- **Reliable** – deliveries are punctual and commodities are undamaged
- **Available** – door to door services are provided 24 x 7, Europe-wide
- **Accessible** – customers deal with one-stop shops / single entry points
- **Secure** – commodities reach their intended destinations securely, and no intrusions are possible;
- **Sustainable** – built to last, strike the right balance between environmental impact, cost to the customer, and meeting societal needs
- **Accountable** – customers have a contract with one party responsible for performance during transport
- **Affordable** – in the position to offer competitive prices to customers and sufficient profits to operators and investors
- **Transparent** – all stakeholders understand the relation between public costs and market prices (per infrastructure / slot / facility / commodity).

Increasing levels of congestion will place mounting pressure on mobility services, particularly in large urban areas. This will give rise to comprehensive, integrated service concepts and business models that complement existing modes, and for which the dominant factor will be extensive cooperation between the various actors in the chain.

The dominance of high levels of customer service (short lead times, short product life cycles, individualization of consumers, high levels of customer service in a larger Europe Union) over transport cost (low share of overall product delivery cost) has lead to shippers and service providers focusing on product and service delivery (and thus enhancing the customer experience) rather than on the efficiency of the transport systems. Solution deployed by shippers and service providers alike are specific, and do not take sufficient advantages of economies of scale. Breakthroughs in efficiency increase and decarbonization can only be attained if horizontal collaboration is facilitated. This will be based on advances in information technology, supply chain management, and needs to be facilitated by a proper legal framework, especially in the area of anti-trust.

Cooperation and collaboration are both needed to optimise the movement of goods and people to better reflect the actual demand for mobility services (including public transport). Models and service solutions will be introduced to support innovative business practices, route planning regimes and efficient trans-shipment of goods (in particular over the 'last mile') and people, between modes and networks. Again, ICT and a better knowledge of transport demand will play a major role in these developments, as will the trend towards extended standardisation for freight carriers in terms of dimensions and modularisations.

Industry and authorities will agree in a timely fashion on basic requirements, such as standardisation, in view of deployment process will be in place, so that incompatible solutions, which would create new barriers for the functioning of the Internal Market, would be avoided.

The regulatory framework will be adapted to enable the effective implementation of innovations

Standardisation and regulations should be in place by 2020 to such an extent that authorities and industry can invest in solutions that can be rolled out directly into the market.

On the targets specified above, the expectation is as follows:

	2015	2020	2025
Transport efficiency: load factors	65%	75%	85%
Environmental footprint: carbon emission	230 mln ton (-/- 15%)	200 mln ton (-/- 25%)	162 mln ton (-/- 40%)
Negative effects: congestion	6500 km (-/- 15%)	5600 km (-/- 25%)	4500km (-/- 40%)

It is important to realize that transport is not an independent phenomenon, but is by and large a result of choices in the design of the entire supply and delivery network. Hence, spatial policies in the member states have a substantial effect on eventual transport flows. In the long term, towards 2025 and beyond, it is therefore crucial that a coherent vision is developed that aligns spatial policies with the resulting transport requirements. Trans-European network planning needs to precede the developments in markets and investments in manufacturing and distribution resources. Research is needed that will tell us how to better predict and influence flows of transport by spatial policies.

4. Milestones

A great deal of research has been carried out, and is still on-going, in the domains of City Logistics, Green Hubs & Green Corridors and Supply Chain Management.

Further research is still needed, as is also the case for the Electrification of Road Transport and Long Distance Truck themes of the ECGI.

There are already sufficient solutions that have been developed to, at least, be able to draw up an effective implementation plan which will help focus efforts on future needs to meet the general expectations.

Therefore, for all three domains, the same milestones are proposed:

Milestone I (to 2015) Setting the Targets and picking the low hanging fruit

Focus is on setting and agreeing targets, assessment and evaluation methodologies, identification of standardisation and harmonisation requirements, in relation to all relevant research work already in existence.

Milestone II (to 2020): Building the Partnerships

Redesign long distance freight and city mobility concepts, redesign the policy and regulatory framework, build partnerships, and draft corresponding financial investment & exploitation plans

Milestone III (to 2030): Roll-out

The roll-out of Europe-wide applications (developed along the lines above)

	Milestone 1 Setting the Targets picking low hanging fruit	Milestone II Building the Partnerships	Milestone III Roll-out
City logistics	Developing profound knowledge of the trends in city logistics and models of the underlying processes, as well as a pervasive analysis of consumer needs and behaviour in metropolitan areas Understanding of the criteria and indicators for measuring the sustainability and performance of city logistics	Efficient distribution systems and technologies, based on a holistic approach for sustainable urban mobility and city logistics Modular loading units and systems of transfer (including “zero emission” vehicles) for city logistics Interoperable Soft and Hard infrastructure for city logistics and	Implementing the European way to sustainable urban mobility and city logistics, recognising the similarities and differences between European cities

	<p>Comparative city logistics research and developing show cases for adoption across Europe</p> <p>Pilot project for logistic solutions with electric vehicles</p>	<p>standardisation of equipment and systems for city logistics</p> <p>Establishment of technical standards for the use of loading units and therefore of transfer equipment</p>	
Green Hubs and Green Corridors	<p>Current Scenario, Opportunities and Key Performance Indicators</p> <ul style="list-style-type: none"> • Developing a vision on the dimensions and capabilities of green hubs and corridors • Developing common European measurement system for green logistics • Technologies <p>Vehicular Technologies (i.e., ITS enabled Convoy driving, Modular Vehicles, Fast Freight Trains, Unmanned and driverless Vehicles)</p> <p>Energy Storage, Smart Grids, Energy Efficient transshipment technologies</p> • Identification of Green Corridors and hubs <p>Exploring new technologies and solutions, such as overnight electric convoys, self organising stacking systems and transport, platooning,</p> 	<p>New Business Models for Green Hubs and Green Corridors</p> <ul style="list-style-type: none"> • Integration of hubs and corridors <p>Developing the mechanisms for balancing the use of modes in hubs and on corridors (linking information availability with logistics coordination)</p> • Business models for green hubs and corridors <p>New pricing schemes, new services, new capabilities</p> 	<p>Network Integration</p> <ul style="list-style-type: none"> • Integrating Hubs and Corridors across Europe <p>Acknowledged European and International Standards for Green Logistics.</p> <p>Achieving seamless modular integration of solutions for green hubs and corridors</p> <p>Information sharing and technology diffusion, co-design on green logistics</p> <p>Models for ongoing consensus building</p>

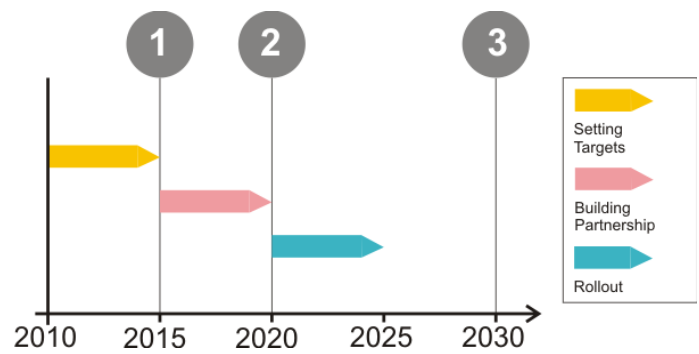
	<p>capacity allocations mechanisms.</p> <p>Blue print of EU network, of hubs enabling use of Sustainable Transport Solutions including appropriate location, number and capacity of transfer nodes</p> <ul style="list-style-type: none"> • Sustainability footprint of logistics transport chain <p>Adequate pricing and investment rules for the transport sector. Stimulation of technological development that supports sustainable solutions (launched in call 2010)</p> <p>Address increasing customer need for understanding the footprint (Life Cycle Assessment) of their Supply chains.</p>		
Intelligent Logistics Systems, optimising e-freight	<p>Defining Opportunities</p> <ul style="list-style-type: none"> • Information community development for green logistics in cities, hubs and corridors <p>Developing information system adoption and interoperability among logistics operators and service providers</p>	<p>Interoperability between modes and Networks. IT applications for logistics</p> <ul style="list-style-type: none"> • Paperless and electronic flow of information <p>IT solutions to enable information share and exchange for Logistics, used for both planning execution, and invoicing of logistics services.</p>	<p>Internet of Freight</p> <ul style="list-style-type: none"> • Large demonstration projects <p>Connecting port community systems across Europe</p> <p>Integrating vehicle tracking solutions for truck, inland barging</p>

	<p>Connecting green hubs and cities with long distance trucking in green corridors</p> <p>Exploring interconnectivity of existing freight information systems, community platforms and global visibility systems</p> <ul style="list-style-type: none"> • New Legal and Regulatory Framework <p>Simplified documentation processes based on common set of terms which can be used electronically</p>	<p>Exploring use of real time data feeds for footprint measurement, statistics collection, and government supervision</p> <ul style="list-style-type: none"> • Horizontal collaboration <p>Integration e-freight initiatives across modes and hubs</p> <p>Developing low cost, low barrier interface solutions for information system integration</p>	<p>and rail</p> <p>Integrating cargo, vehicle and loading unit tracking in supply chains</p>
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5. Roadmaps

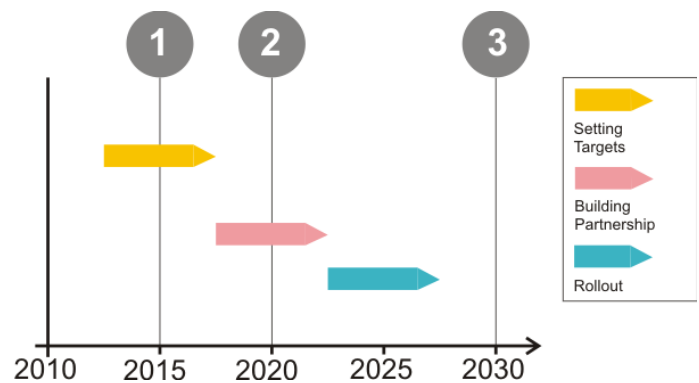
City Logistics

Consumer Centered Analysis
Efficient Distribution Systems and Technologies
European Sustainable Urban Mobility



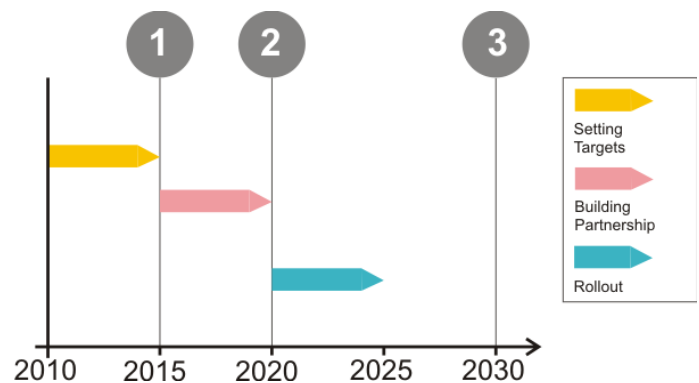
Green Hubs & Green Corridors

Current Scenarios, Opportunities and Key Performance Indicators
New Business World for Green Corridors
Network Integration



Supply Chain Management

Define Opportunities
Interoperability Between Modes & Networks, IT Applications for Logistics
Internet Freight



6. Recommendations

The above milestones and roadmap must be developed in common upstream with EU transport policies and other industrial initiatives. In addition it must be carried forward through Public Private Partnerships, particularly through Innovation Partnerships, to ensure that the measures are put in place.

The revised White Paper on the Common Transport Policy, to be published in 2010, will lead to a further and in depth debate about verifiable targets and solutions which will be fundamental for the first milestone definition of these roadmaps' main three domains.).

The review of the 7th Framework Programme will simultaneously enable more efficiently the research and innovation activities to achieve the European Green Cars Initiative mission. As stressed in TRA 2010, more innovation and roll-out at large European scale will be needed.

Most relevant are the following:

- The Mid-Term Review of the 2001 Transport White Paper¹ in which the expression “Co-modality” was introduced to signify optimal use of all modes of transport singly and in combination.
- The Freight Logistics Action Plan² launched by the European Commission, amongst a number of policy initiatives, to help Europe address its current and future challenges relies on co-modality and on advanced technology to ensure a competitive and freight transport system whilst promoting environmental sustainability. The Freight Logistics Action Plan focuses on quality and efficiency for the movement of goods, as well as on ensuring that freight-related information travels easily between modes. These objectives can be reached primarily through e-Freight³ solutions aiding collaboration between all stakeholders involved in freight transport chains. Part of the action plan is establishing synergies with related policies such as e-Maritime.
- The ITS Action Plan Oct 2008 “ITS tools constitute a core enabler for the management of such logistic chains, notably in maintaining a paperless information trail in the management of the physical flow of goods (e-Freight).”
- The e-Customs initiative introduced by Decision No 70/2008/CE. The e-customs vision for ‘electronic declarations as a rule’, interoperable national computer systems and single window solutions will facilitate information exchange on cargo movements. In the context of the European e-Customs and the Modernised Customs Code programme Single Windows are foreseen.

¹ “Keep Europe moving – Sustainable mobility for our Continent” (COM 2006, 314)

² Communication from the Commission COM 2007 / The EU's freight transport agenda: Boosting the efficiency, integration and sustainability of freight transport in Europe COM(2007) 606 final

³ According to EU Freight Logistics Action Plan, "e-freight", denotes the vision of a paper-free, electronic flow of information associating the physical flow of goods with a paperless trail built by ICT. It includes the ability to track and trace freight along its journey across transport modes and to automate the exchange of information for regulatory or commercial purposes.

- Directive 2009/17/EC, in the framework of the Third Maritime Safety package, modifying Directive 2002/59/EC for establishing a Community vessel traffic monitoring and information system (the "VTM Directive"). One of the main objectives of the amended Directive is to guarantee that all Member States will be interconnected via the Community maritime information exchange system SafeSeaNet (SSN) in order to obtain a complete overview of the movements of ships and dangerous or polluting cargoes in European waters. The integrated maritime transport strategy opens new horizons for SSN as a core platform to support "upgraded EU maritime transport information management".
- Communication and action plan with a view to establishing a European maritime transport space without barriers COM(2009) 10/2. Short term actions include 'simplification of customs formalities for vessels only sailing between EU ports' and 'clarification of the use of IMO/FAL harmonised forms through a proposal to the European Parliament and the Council for a directive replacing Directive 2002/6/EC on reporting formalities for ships arriving in and/or departing from ports. Further the Commission is preparing measures for "National Single Windows" (systems that allows traders to lodge information with a single body to meet all import or export-related regulatory requirements).
- The development of the European Border Surveillance System (EUROSUR), which foresees the gradual creation of a common information sharing environment for the EU maritime domain. EUROSUR, focussing initially on the southern and eastern external borders of the EU, suggests to Member States a roadmap for gradually developing a common technical framework to support Member States' authorities in reaching full situational awareness over the coming years. EUROSUR is closely related to the 'integration of maritime surveillance activities' as described in the Commission documents COM 2009-538 'Towards the integration of maritime surveillance: a common information sharing environment for the EU maritime domain' and SEC 2009-134.
- The e-Maritime aimed at fostering the use of advanced information technologies for working and doing business in the maritime transport sector. The e-Maritime initiative will be proposing a Framework Directive and other policy measures.
- The TEN-T programme aimed at developing an efficient trans-European transport network (TEN-T) to support the re-launched Lisbon strategy for competitiveness and employment in Europe. The TEN-T programme is the main instrument for EU financing of transport infrastructure developments across all modes including Motorways of the Sea which invariably rely on advanced ICT integration technologies.

APPENDIX 1

Public Private Activities

GS1

GS1 is a global organisation dedicated to the design and implementation of global standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across sectors. The GS1 system of standards is the most widely used supply chain standards system in the world.

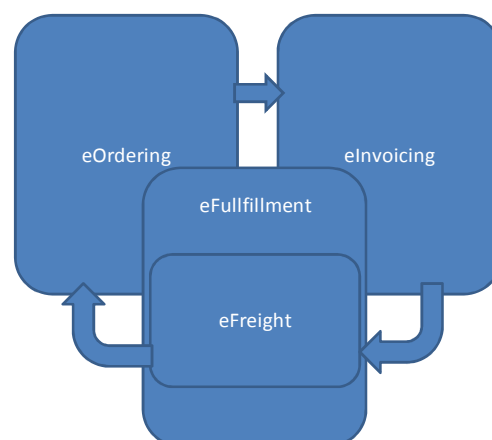
GS1 has established the GS1 Logistics Forum (LF) where Retailers, Manufacturers, Material Suppliers and Logistic Service Providers are represented. The mission of the LF to lead the development and drive the implementation of the GS1 Logistics Solutions to gain business benefits for global supply chains by fostering interoperability between the partners to overcome barriers of scalability and achieve visibility. The LF has already developed the first version of what is called the Logistics Interoperability Model (LIM) Version 1 and the first version of the Business Requirements Analysis Document (BRAD) For Transport Management. This initiative is backed by industry. Cooperation has already been established.

PEPPOL

EU member states have expressed a political will to change public procurement significantly. The Manchester ministerial declaration of 24 November 2005 for example defines that “by 2010 all public administrations across Europe will have the capability of carrying out 100 % of their procurement electronically and at least 50 % of public procurement above the EU public procurement threshold will be carried out electronically.” The PEPPOL project is strongly supporting this target.

The broader vision of PEPPOL is that any company (incl. SMEs) in the EU can communicate electronically with any EU governmental institution for all procurement processes. The objective of the PEPPOL (Pan-European Public eProcurement On-Line) project is to set up a pan-European pilot solution that, conjointly with existing national solutions, facilitates EU-wide interoperable public eProcurement.

PEPPOL limits itself to the situation where the Purchaser orders (eOrdering) a product from the Manufacturer and the Manufacturer invoices the Purchaser (eInvoicing); ref the upper part of the figure below.



To ensure that the product is efficiently delivered to the Purchaser, the loop needs to be closed (eFullfillment, which includes eFreight). The proposed Framework should be supporting public procurement to exploit the full potential of PEPPOL.

Mode Based Initiatives

ITS

The Action Plan for the Deployment of Intelligent Transport Systems (ITS) in Europe dealing with road transport and interfaces to other modes was completed in 2008.

RIS

Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community [Official Journal L 255, 30.9.2005] sets the stage for traffic management on inland waterways in Europe.

RISING is a 7th FP project aiming at improving the competitiveness of door-to-door transport chains involving inland waterway transport and utilising River Information Services to achieve this

TAF/TSI

The Directive 2001-16 asks the railway stakeholders to specify the interoperability constituents for: infrastructure, energy, control and command and signalling, traffic operation and management, rolling stock, maintenance and telematics applications for passenger and freight services.

The latter has been further specified in the TAF/TSI; Technical specifications for interoperability for Telematic applications for freight. The TAF/TAS message specification has been completed and implementation has started.

The EU e-Maritime initiative

The EU e-Maritime initiative is aimed at fostering the use of advanced information technologies for working and doing business in the maritime transport sector. However, the ultimate goal of the EU e-Maritime initiative is to make maritime transport more efficient, safer and environmentally friendlier by improved information use, knowledge creation, facilitation of business collaborations and supports to cope with externalities. The EU e-Maritime initiative aims also to improve the life at sea by providing internet-based services for mariners, thus raising the attractiveness of the seafaring professions.

IATA

IATA has its own e-Freight initiative and is in the business of deploying the concept.

Standardisation

CEN

UN/CEFACT

UBL/OASIS

Link to the US DOT Freight Management Initiative.

Relevant EU Projects

Freightwise

Freightwise⁴ was an EU funded project under the 6th Framework Programme (6th FP) for research and development that was completed in April 2010. Freightwise buildt on (and contributed to) ARKTRANS⁵, developing a simple, standard framework for information exchange in transport that may be implemented at a very low cost.

e-Freight⁶

e-Freight may be considered a continuation of FREIGHTWISE and will provide an e-Freight platform supporting the design, development, deployment and maintenance of e-Freight Solutions which will be validated in business cases and pilots involving representatives from all relevant stakeholders in surface transport including large and small businesses and authorities. e-Freight deals with Framework, Single transport Document and Single Window.

Integrity

INTEGRITY is a project intending to significantly improve the reliability and predictability of door-to-door container chains.

The kernel of the project is the development of the so-called Shared Intermodal Container Information System (SICIS) allowing authorised companies and authorities to access planning and status information of selected transports. A framework is required to facilitate interaction between the SICIS and the stakeholders.

Smart-CM

Smart-CM⁷ aims to make trade and transport more efficient, secure, visible and competitive across the world in a global intermodal context, working along with existing initiatives such as that of AEO and the Green Lanes implementation.

Smart-CM will provide a simple - transparent - neutral - easy to handle solution for the interaction between public administrations (primarily customs) and the market players involved in the container transport chain management and administration business.

The interaction mentioned in the previous paragraph will require a framework for interaction and interoperability.

SmartFreight

The SMARTFREIGHT project wants to make urban freight transport more efficient, environmentally friendly and safe by answering to challenges related to traffic management, freight distribution management, and a better coordination between the two.

The main aim of SMARTFREIGHT is therefore to specify, implement and evaluate Information and Communication Technology (ICT) solutions that integrate urban traffic management systems with the management of freight and logistics in urban areas. The actual transport operations carried out by the freight distribution vehicles will be controlled and supported by means of wireless communication infrastructure and on-board and on-cargo equipment.

⁴ www.freightwise.info

⁵ www.arktrans.no

⁶ Apart from being a research project, e-Freight is also a policy initiative developed as part of the revised Freight Transport Logistics Action Plan from October 2007

⁷ <http://www.smart-cm.eu/>

Euridice

Euridice is an EU-funded project under FP7 funded through DG INFSO. Euridice concentrates on using smart tags (RFID etc.), combined with a fixed and mobile web services infrastructure, to facilitate direct interaction between cargo items (individual packages) and between cargo items, load units (pallets, containers etc.), vehicles, and infrastructure. Euridice requires a framework to facilitate such interactions.

The term “intelligent cargo” refers to cargo items that are equipped with active radio-frequency identification (RFID) tags⁸. Such tags typically contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal. An active RFID tag contains a battery and can process and transmit signals autonomously.

RISING

RISING⁹ is a 7th FP project aiming at improving the competitiveness of door-to-door transport chains involving inland waterway transport and utilising River Information Services to achieve this. RISING builds on the results of Freightwise.

DiSCwise

DG Enterprise has commissioned a study aiming at “assisting SMEs to participate in global digital supply chains in the transport and logistics sectors in the single market by (...) providing standard architectures”.

EasyWay

EasyWay is a project under the EU TEN-T budget where 21 European member States, through their road operators as partners, cooperate on the establishment of Core European Services for European travellers and hauliers. The project shall be seen as the member states response to the requirements of the EU ITS Action Plan. Services are mainly relating to road traffic and transport, but include interfaces to other modes and the exchange of information at modal shift points. A specific area within EasyWay is dedicated to Freight and Logistics services.

SuperGreen

A new EU project entitled “Supporting EU’s Freight Transport Logistics Action Plan on Green Corridors Issues” (abbreviated name “SuperGreen”) was started on Jan. 15, 2010. The 3-year project is a Coordinated Action supported by the European Commission (DG-TREN) in the context of the 7th Framework Programme. The purpose of the project is to promote the development of European freight logistics in an environmentally friendly manner. Environmental factors play an increasing role in all transport modes, and holistic approaches are needed to identify ‘win-win’ solutions.

BeLogic

Started in 2008, developing benchmarking and KPI concepts and solutions.

⁸ <http://en.wikipedia.org/wiki/Rfid>

⁹ www.rising.eu